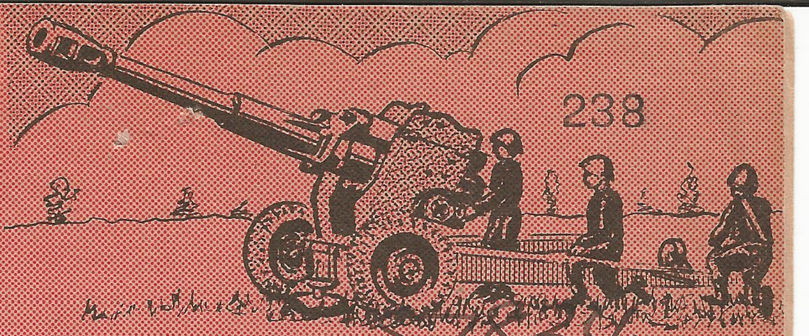

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ARMY TECHNICAL INTELLIGENCE REVIEW

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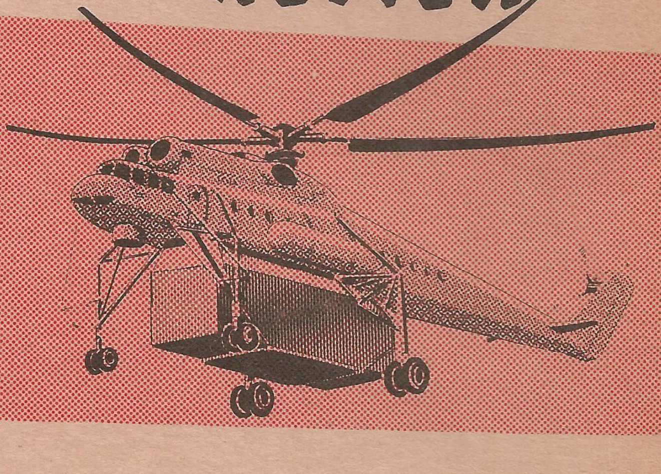
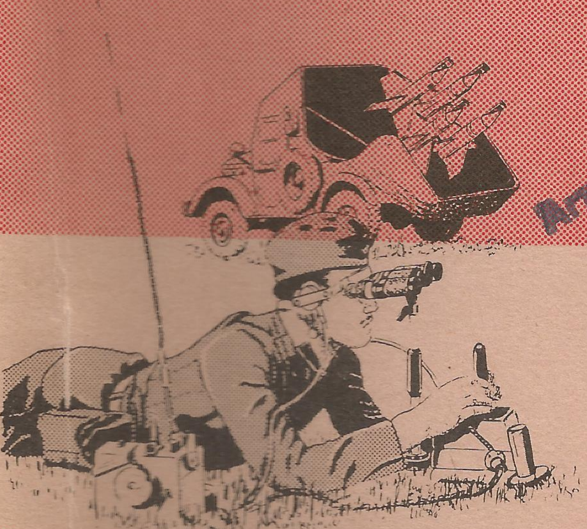
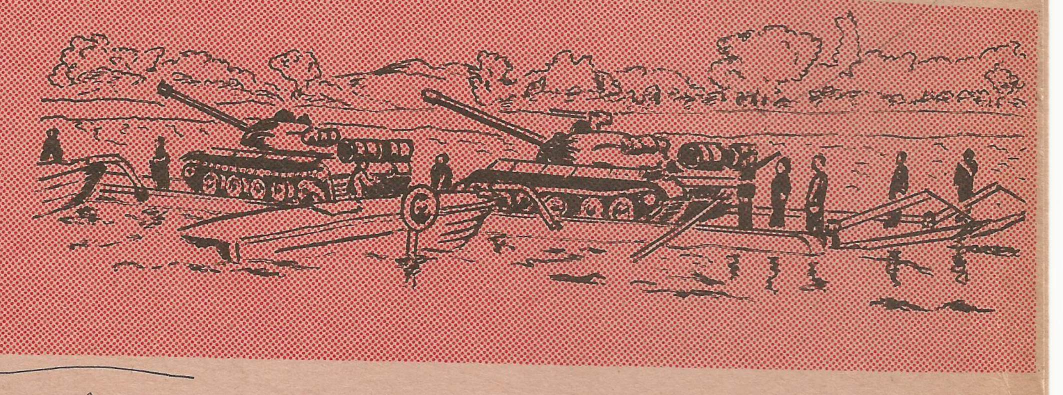




Armour School
29 JAN 1971
INFORMATION BUREAU

SUPPLEMENT

JAN 1971



No 98

ARMY TECHNICAL INTELLIGENCE REVIEW No 98

SUPPLEMENT

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FOREWORD

This edition covers a wide range of equipment. Of particular interest are two examples of original CHICOM equipment, the Amphibious Tracked APC Type M 1967 which was identified for the first time in Albania and the 107 mm Rocket Launcher, the first modern equipment of its type to be designed and produced completely in China. As the CHICOMS continue to attempt to expand their influence overseas and the potential of their defence industry continues to grow, collectors should be alerted to the possibility of its products appearing in many varied parts of the world. The 107 mm Rocket Launcher in particular could perhaps be recommended as a "best buy" for all up-to-date MAOIST insurgents!

For various reasons it has been found necessary to change the system of numbering the RESTRICTED and SECRET edition of the Review. As from this issue, the SECRET edition will be called 'The Supplement to the RESTRICTED edition.' Thus this edition is issued as 'The Supplement to the RESTRICTED ATIR No 98', No 98 being the edition published in October 1970. We will continue to publish alternately two RESTRICTED editions and two SECRET Supplements a year.

S. C. SMITH
Colonel
Tech Int(A)

Corrigenda

ATIR No 97

Page 3 - under photo line 3 delete rear insert road.

Page 17 - under photo delete fuel insert water.

Page 18 - lower photo delete fuel insert water.

Page 21 - Soviet T 55 delete MTO insert MTU.

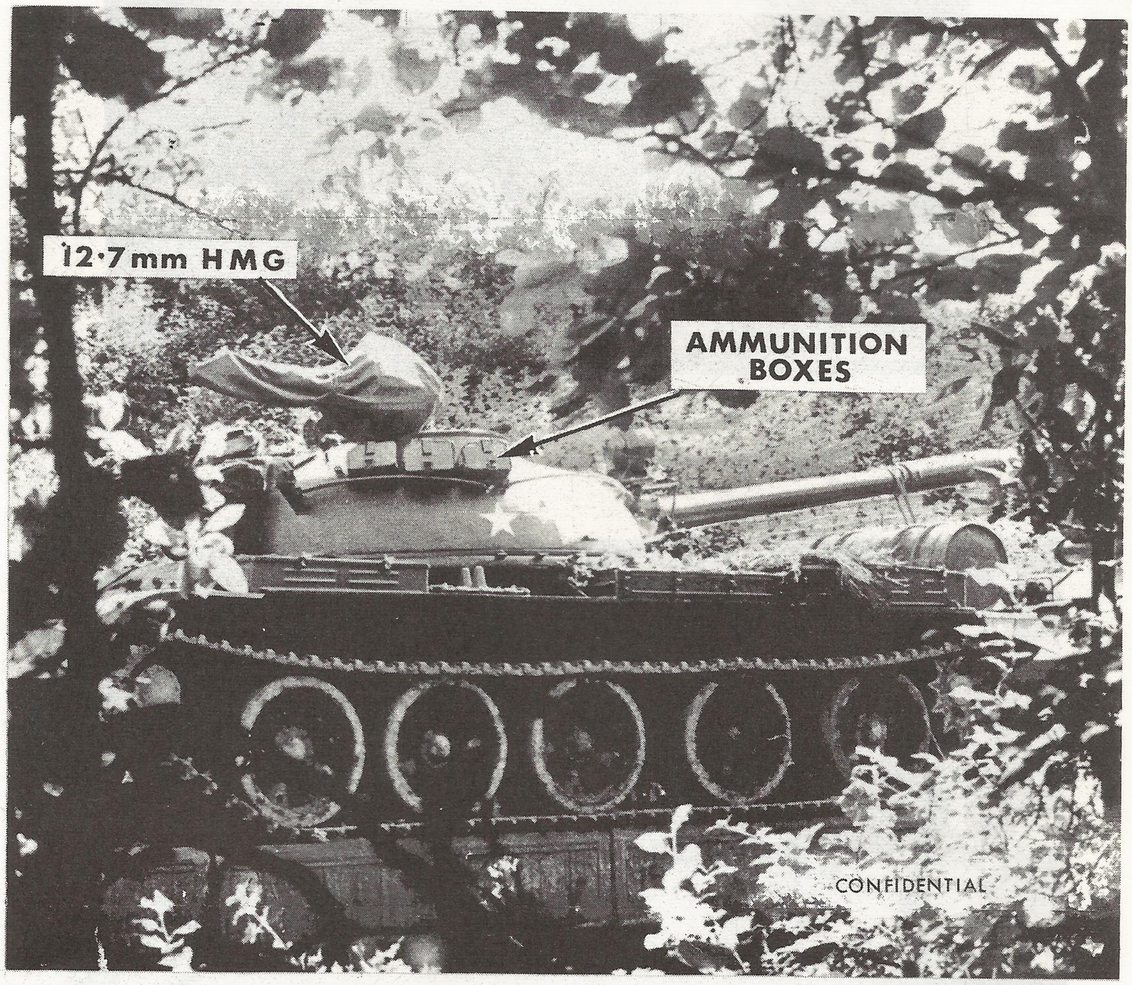
Page 25 - Fig 1 Frog 7

DATA - delete all details

I. Modifications to Soviet T-62 (SECRET)

The Soviet T-62 tank has now been in production for a considerable number of years, and during this time modifications and improvements to it must have been carried out.

Recently two such changes have come to light. First as seen in the photo below is the mounting of a 12.7 mm HMG gun on the Commanders Cupola.



SOVIET T-62

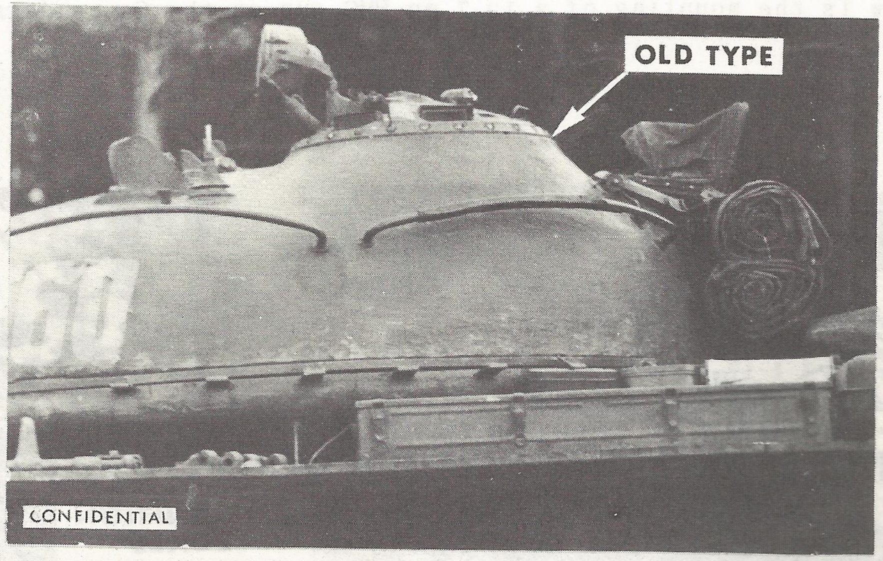
Although the idea itself is not new this is the first time that it has been seen on T-62, and the last Soviet tank that it was mounted on was the now obsolescent T-54.

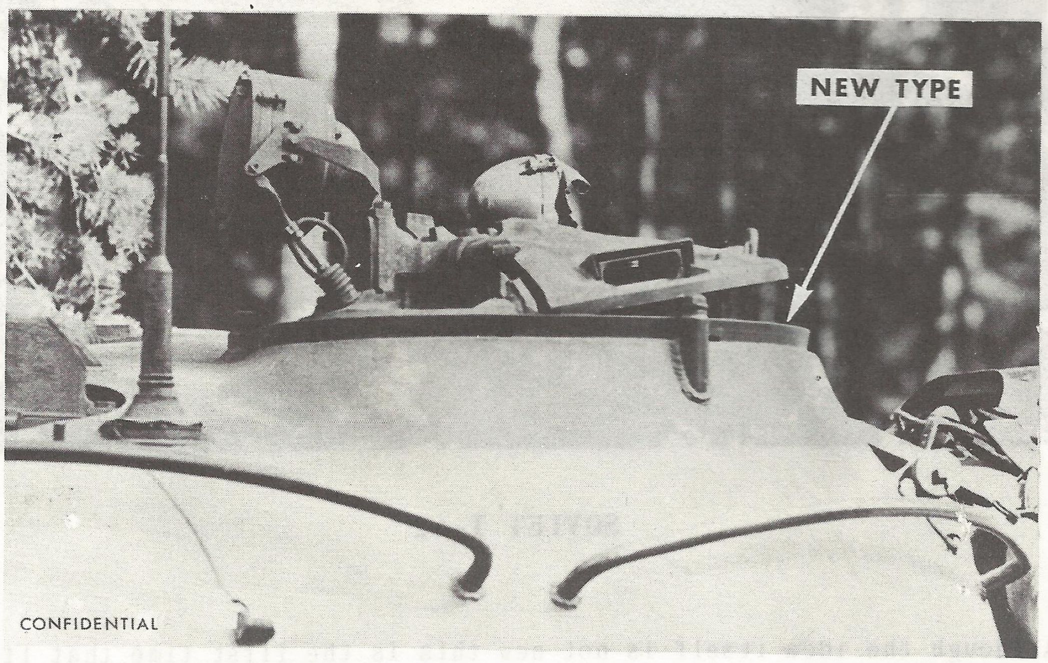
Modifications to Soviet T-62 Tank

The second change is in the Commanders Cupola.

There appears to be a change in the cupola ring.

The reason for this is not clear although it has been suggested that it could be used to secure the T-62 training schnorkel or be something to do with the 12.7 mm AA gun.


OLD TYPE
CONFIDENTIAL


NEW TYPE
CONFIDENTIAL

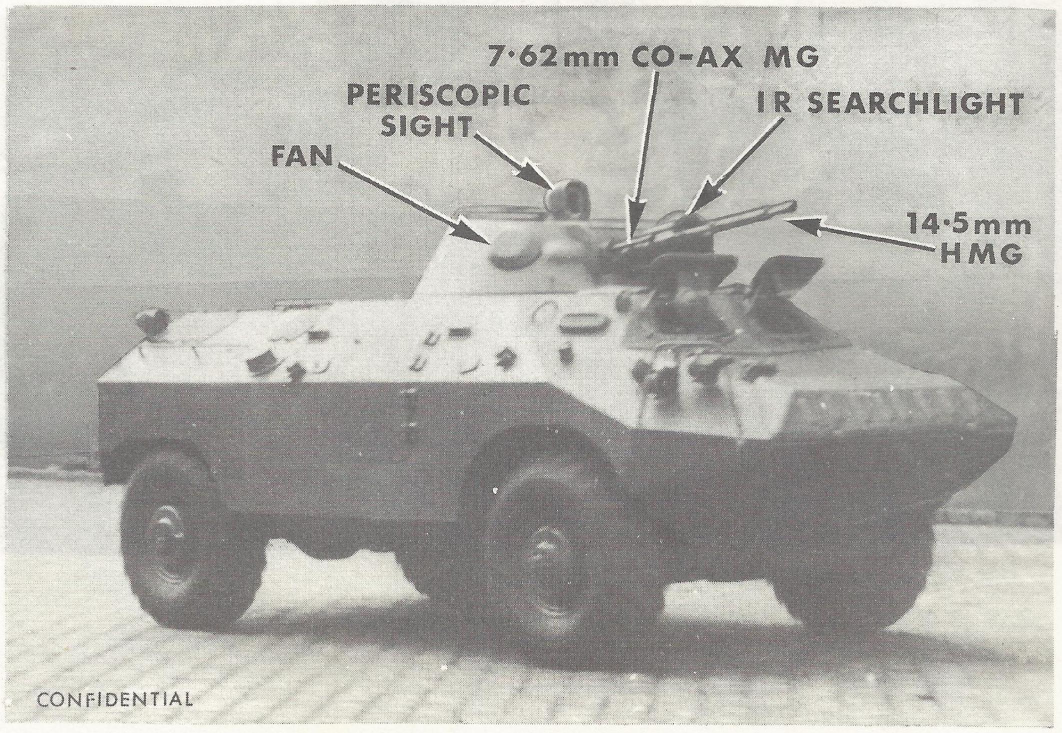
T-62 Turret

2. Hungarian FUG M 1970 (SECRET)

This new Hungarian armoured car was seen for the first time in Hungary in April of this year.

It is based on the FUG (OT-65) chassis and has a turret of Hungarian design. A considerable number of these vehicles were seen and it can be assumed that it is in full production and in service in the Hungarian Army.

Its role is thought to be reconnaissance, similar in fact to that of BRDM-2 in the Soviet Army.



FUG M 1970

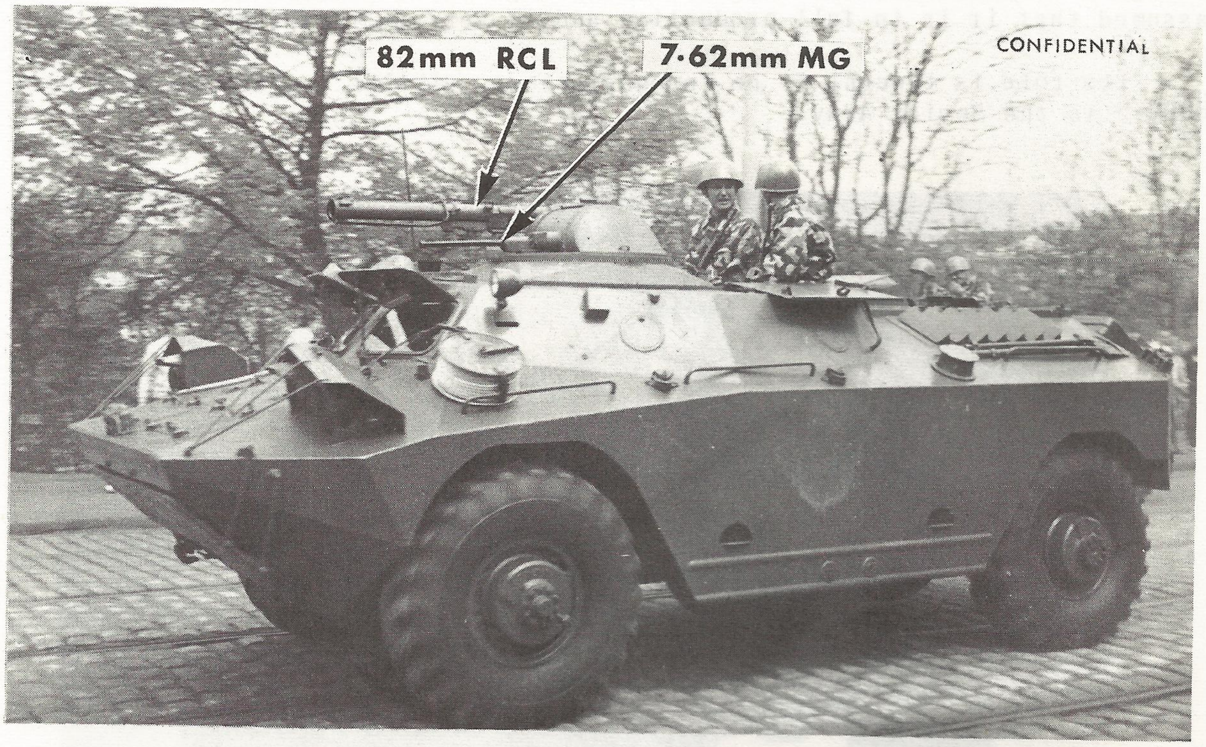
Its estimated characteristics are:

Weight		7 tons
Crew		4
Armament		14.5 mm HMG 7.62 mm Co-ax
Engine		100 hp petrol
Fuel capacity		150L (33 gallons)
Range		500/600 Kms (310-372 miles)
Armour.	Turret front:	10 mm
	Side	5-8 mm

Vehicle capable of swimming, propulsion being by water jet.

3. Czechoslovak Modified OT-65 (SECRET)

A modified FUG (OT-65) was recently seen on a parade in Prague. A small turret similar to that mounted on the OT-62 tracked APC has been installed on the top of the vehicle. This turret contains a 82 mm RCL gun and a 7.62 mm MG.



FUG (OT-65)

Characteristics of the 82 mm RCL gun are:

Name: Czechoslovakian Recoilless Weapon TARASNICA

Role: Anti-tank and anti-personnel

Smooth bore barrel. Fires shaped charge and fragmentation bombs/shells.

Calibre - 82 mm

Weight - 20 Kg (44 lbs)

Length of weapon - 1475 mm

Weight of bomb - 3.6 Kg (7.92 lbs)

Effective rate of fire - 6 bombs per minute

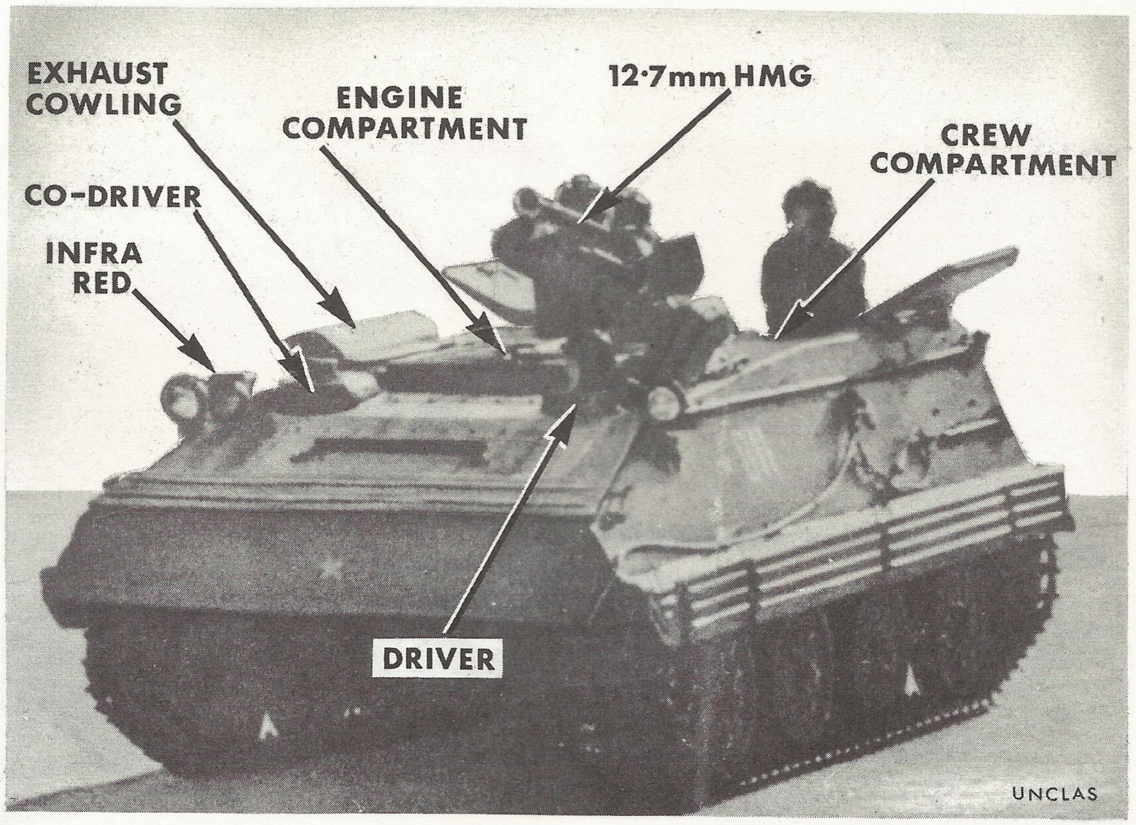
Effective range for stationary targets - 600 m. (660 yds)

Effective range for moving targets - up to 300 m. (330 yds)

4. CHICOM Amphibious Tracked APC Type M-1967 (SECRET)

It had been suspected for some time that the Chinese were producing their own APC. However, it was not until a recent parade in Albania that this vehicle was identified for the first time.

This vehicle is of particular interest as it is of original Chinese design and is not a copy of any Soviet or Western APC. The road wheels and suspension appear to be similar to those of the Type 62 light tank.


EXHAUST COWLING
ENGINE COMPARTMENT
12·7mm HMG
CREW COMPARTMENT
CO-DRIVER
INFRA RED
DRIVER
UNCLAS

CHICOM APC Type M-1967

Estimated characteristics are:

Weight	9.9 tons			
Crew	3 plus 1 section			
Dimensions:	Height	-	2.21 m	(7.29 ft)
	Width	-	2.9 m	(9.57 ft)
	Length	-	5.91 m	(19.5 ft)
Armament	12.7 mm MG mounted on the roof			
Speed	70 kph			

Vehicle probably capable of swimming; propulsion by tracks.

5. CHICOM Type 59 Tank Gun Stabilisers (SECRET)

There has always been conflicting evidence as to whether the CHICOM Type 59 tank is equipped with a stabiliser.

CONFIDENTIAL

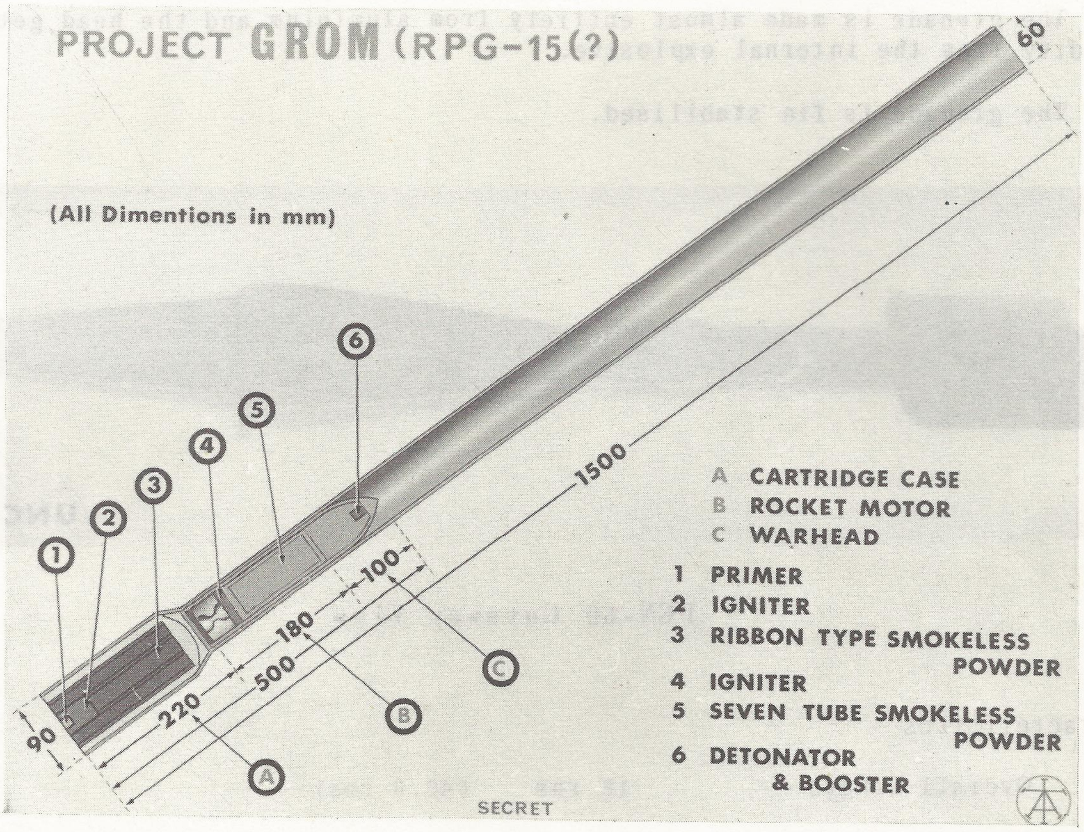
CHICOM Type 59 Tank

There is now firm evidence that at least some Type 59 tank guns are stabilised.

6. Soviet / Czech RCL Launcher - RPG-15 (SECRET)

A new Soviet/Czech hand held anti tank grenade launcher firing an unguided rocket assisted projectile has been developed and is probably now being issued to units. This development programme was known in Czechoslovakia as Project GROM.

The round is fired from the launcher in the conventional manner and after the round has left the launcher a rocket ignites in its base.


PROJECT GROM (RPG-15(?)
(All Dimentions in mm)
60
1500
90
220
500
180
100
1
2
3
4
5
6
A
B
C
A CARTRIDGE CASE
B ROCKET MOTOR
C WARHEAD
1 PRIMER
2 IGNITER
3 RIBBON TYPE SMOKELESS POWDER
4 IGNITER
5 SEVEN TUBE SMOKELESS POWDER
6 DETONATOR & BOOSTER
SECRET

Major known characteristics are:

Calibre	60 mm
Breach Loading	
Ammunition	HEAT/with metallic cartridge case
Stabilisation	Spun by fins at rear of round
Sighting system	Optical
Range	Estimated (Moving targets) - 300-400 metres

Ignition of rocket is estimated to occur at 10-15 metres from the muzzle

This weapon has probably been designed as a replacement for RPG-7.

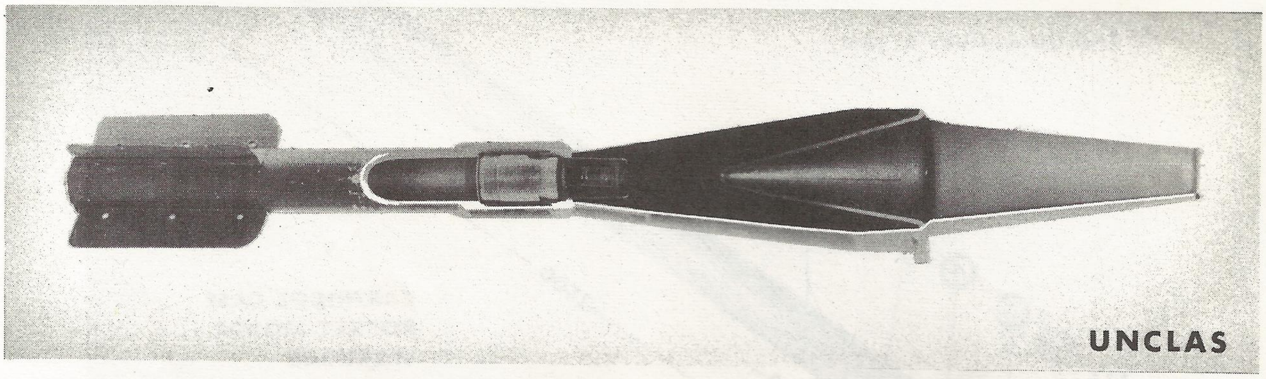
7. Polish HE Anti-Tank Rifle Grenade PGN-60 (CONFIDENTIAL)

The Polish version of the 7.62 mm Kalashnikov Assault Rifle (AK) can be fitted with a grenade launcher to fire two types of grenade, the PGN-60 HEAT grenade and the defensive grenade F1.

The PGN-60 HEAT grenade is completely conventional in its outward appearance, but internally there is a detonator wave shaping device which increases the effectiveness of the shaped charge. There is also a base detonating fuze which is completely self contained activated by gas pressure.

The grenade is made almost entirely from aluminium and the head gets its rigidity from the internal explosive.

The grenade is fin stabilised.



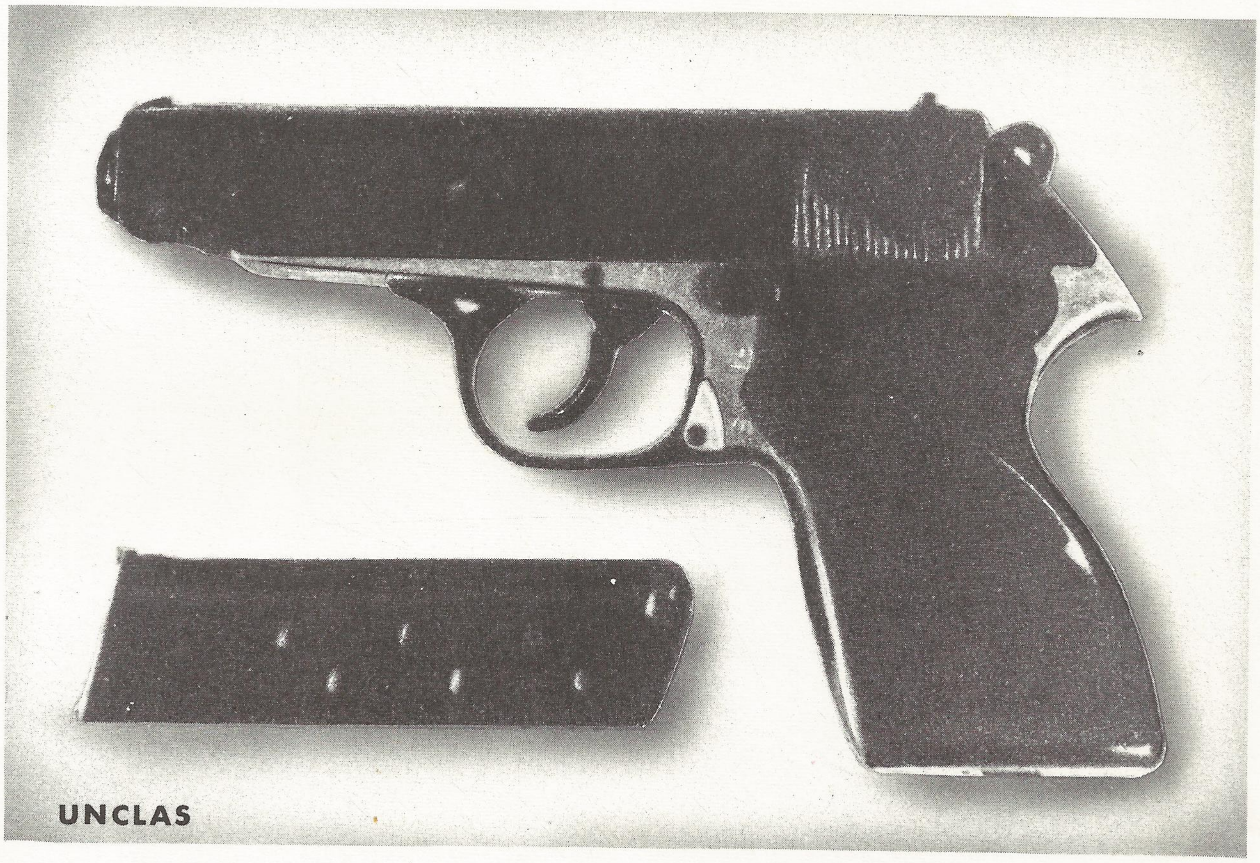
PGN-60 Cutaway View

Characteristics

Overall length	16 ins	(46.6 cms)
Length of Head	9.85 ins	(24 cms)
Total weight	1.28 lbs	(582 grms)
Explosive weight	0.46 lbs	(210 grms)

8. Hungarian RA-63 Pistol (CONFIDENTIAL)

The Hungarians have produced a pistol designated the RA-63 possibly to replace the 7.65 mm Pistol M-48. Many of the main parts are made of aluminium. Plastic is used for the more traditional wooden parts. The useful life of the pistol is 4000 to 5000 rounds.



Hungarian RA-63 Pistol

Other known characteristics are:

Weight with loaded magazine	665 grms	1.5 lbs
Length	17.5 cms	6.8 ins
Height	12.0 cms	4.7 ins
Capacity of Magazine	7 rds	
Rate of Fire	30 rds per minute	

The main advantage of this type of pistol is that it is light and less vulnerable to corrosion.

9. CHICOM 107mm Rocket Launcher 12 Tube Type 63 (CONFIDENTIAL)

The 107 mm rocket launcher came into service about 1963 and is the first modern rocket launcher to be completely designed and produced by the Communist Chinese. It is a mobile, electrically fired area weapon that is well made, rugged, and durable.

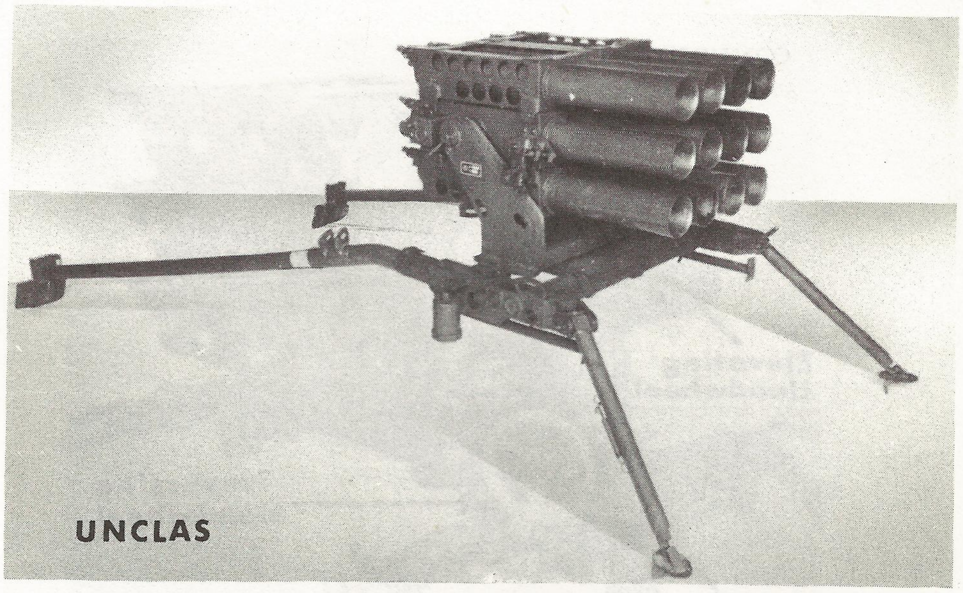


Fig1 107 mm Rocket Launcher - Right Front View

1. Characteristics

a.	Range - Maximum	8300 m (7580 yds)
	Minimum	600 m (550 yds)
b.	Rate of Fire - Maximum	12 rounds in 11 seconds
c.	Re-load time	3 to 5 minutes
d.	Elevation limits - carriage level	-4.5° to +58°
e.	Traverse limits	16° R & L of Centre
f.	Weight - Unloaded	281 kg (618 lbs)
g.	Length - Overall with trails	2896 mm (114 in.)
h.	Width - Maximum	1651 mm (65 in.)
i.	Height - at maximum elevation	1573 mm (62 in.)
	at 0° elevation	1041 mm (41 in.)
j.	Ammunition - 107 mm Rocket H12 Type 1963	
	(1) Weight - Total	19 kg (41.9 lbs)
	Warhead with Fuze	6.7 kg (14.8 lbs)
	Warhead HE Filler	1.2 kg (2.7 lbs)
	(2) Length	837 mm (33 in.)

CHICOM 107 mm Rocket Launcher 12 tube Type 63 (cont'd)

The launcher consists of two major assemblies: the cradle and the carriage. The cradle consists of three rows of four precisely aligned tubes, the bore interior of each tube being chrome plated. The centre row is a four tube section incorporating the trunnion bearings. The upper and lower rows are supported entirely by the centre section and consist of two two-tube sections. The carriage breaks into upper and lower sections and the trails. The cradle is elevated and traversed by manually operated hand wheels on the left side, see Figure 2.

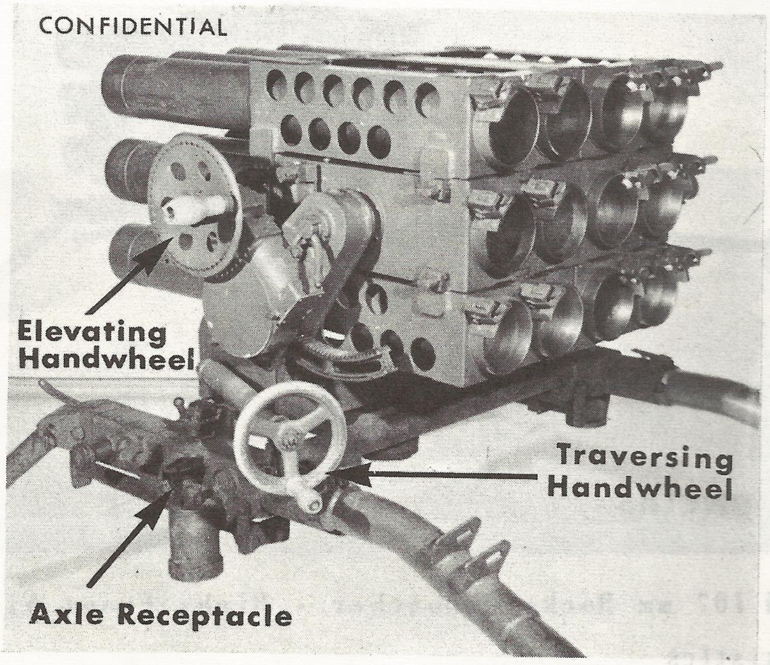


Fig2 107 mm Rocket Launcher Left Rear View

Much thought went into the design of this launcher, resulting in a highly flexible piece of equipment which meets the requirements of both conventional and irregular forces.

In a conventional role an axle would be inserted in the brass alloy bushed receptacle, Figure 2, and wheels attached for towing. This launcher has also been seen mounted on the Chinese BJ-212 'Jeep', Figure 3. It is emplaced, laid, and fired using standard artillery techniques.

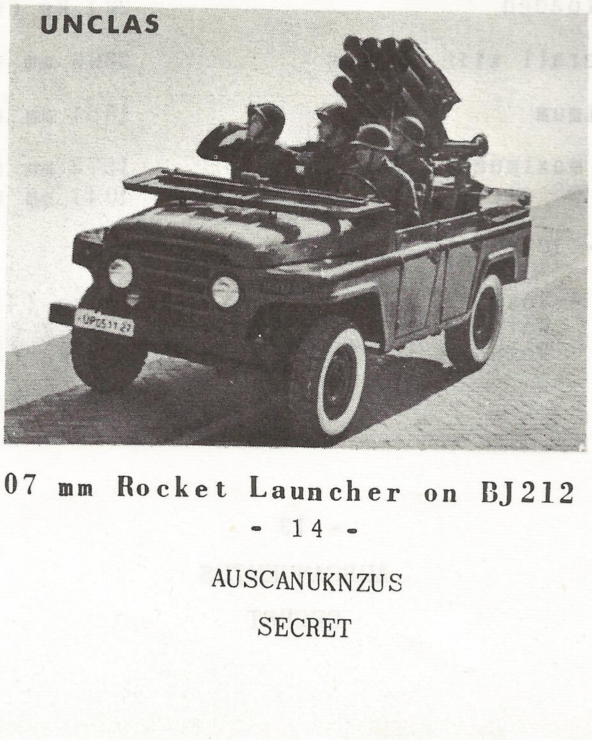


Fig3 107 mm Rocket Launcher on BJ212

CHICOM 107 mm Rocket Launcher 12 tube Type 63 (cont'd)

For irregular forces the launcher conveniently breaks down into five - one man pack loads (trails and four, two-tube sections, Figure 4) and three, two man pack loads (four-tube section and upper and lower carriage sections). The launcher can then be transported by man, animal, or vehicle to the launch site in pieces. It can then be reassembled or used in its individual tubed sections to fire in up to five different directions if required. In the latter case, only the tube sections would probably be carried, and they would be emplaced on mounds of earth.

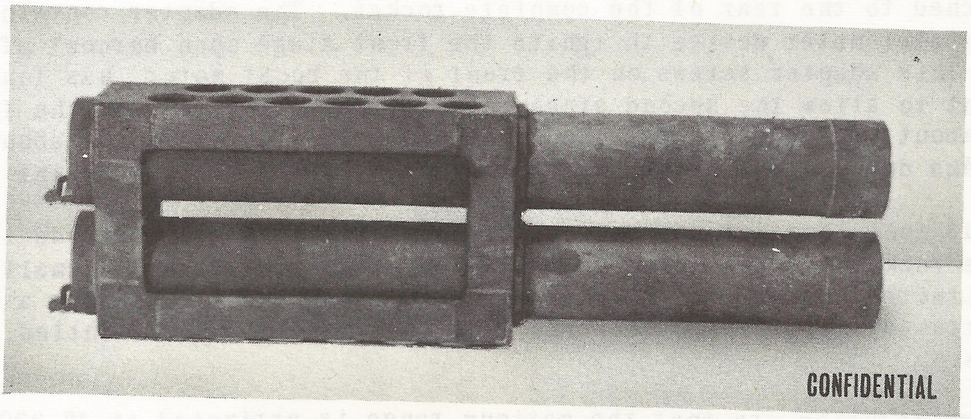


Fig4 Two Tube Section

The ammunition is a 107 mm spin stabilised rocket with an anti-personnel high explosive (TNT) warhead is is easily carried by one man. The rocket nozzle assembly consists of 6 canted nozzles which induce spin as well as forward thrust. This rocket is a follow on design from the CHICOM 102 mm rocket and is similar to the Soviet 140 mm rocket. It uses a centrifugally armed, point detonating fuze that is a modified copy of the Soviet V-25 fuze used on the 140 mm rocket. This fuze has both an instantaneous and a delay setting.

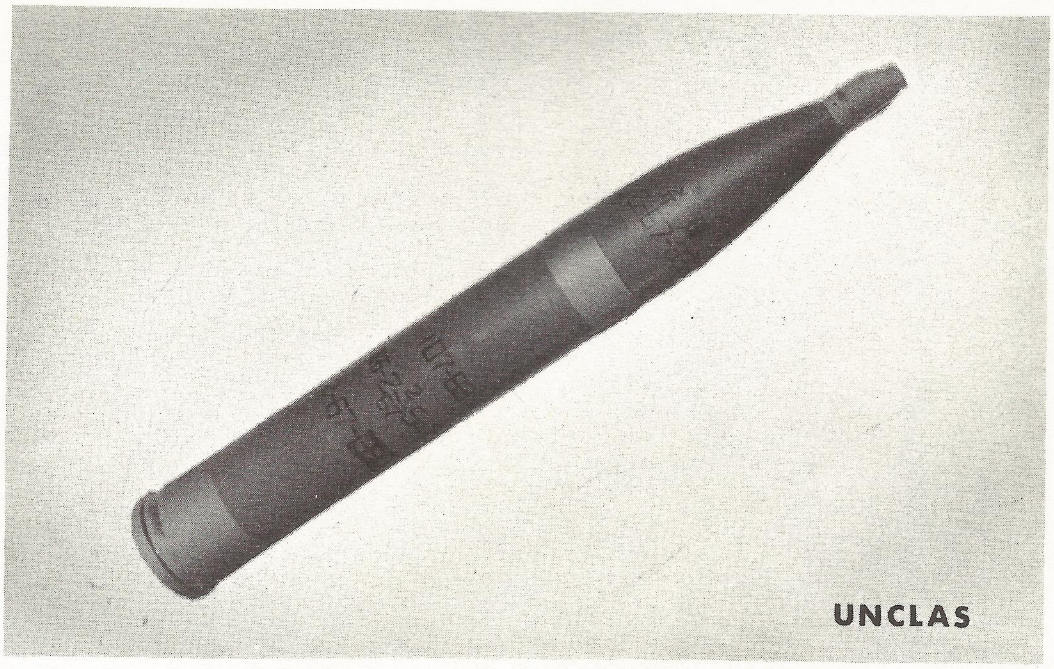


Fig5 107 mm Rocket

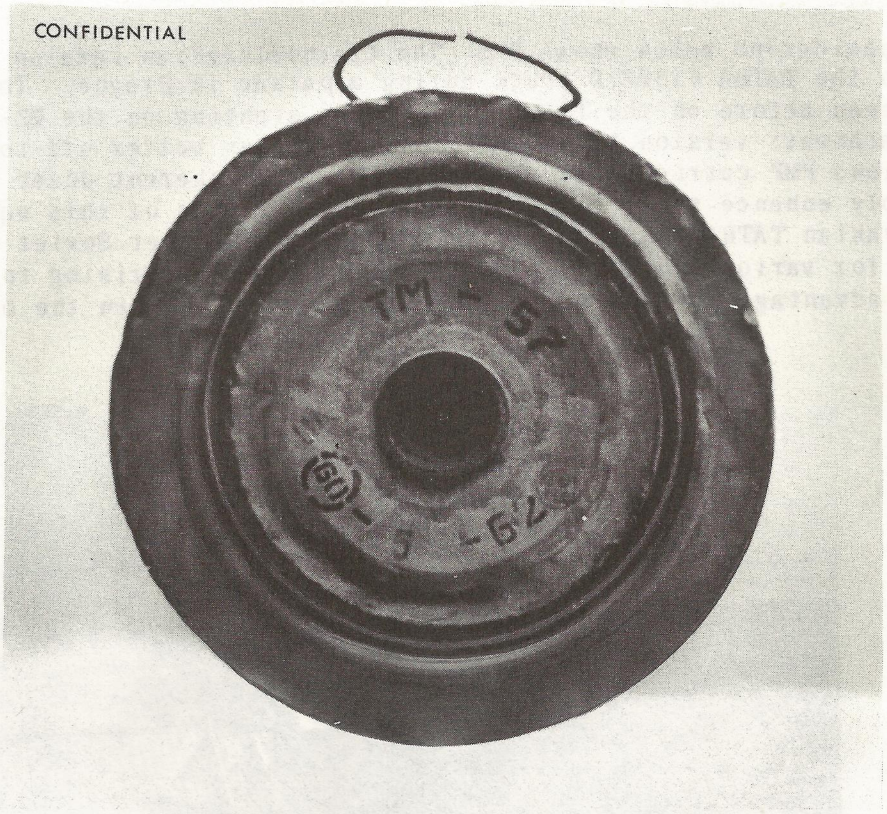
10. Two Stage 122mm Rocket(CONFIDENTIAL)

The latest development in guerilla rocketry is a two stage rocket captured in Cambodia. This rocket consists of one complete 6 foot 122 mm rocket, and a 122 mm booster assembly. The booster assembly consists of a standard 122 mm motor from a 6 foot rocket and an adapter which allows the booster assembly to be attached to the rear of the complete rocket. The adapter contains a set/back armed decelerometer device to ignite the front stage upon burnout of the boost motor. This adapter screws on the front of the boost motor, has four slots at the front to allow the second stage rocket to slip inside with the fins extended, and is about 14 inches long. The total two stage rocket weighs about 170 pounds and breaks down into two motor sections, a warhead section, and the adapter.

A 13 foot launcher constructed of steel pipes and welded rods is used to fire the rocket. It is supported by an adjustable bipod and a small spade on the rear. Limited on-carriage elevation and traverse are provided by a handcrank and screw arrangement. For portability, the launcher can be dismantled into two sections.

First thoughts are that the maximum range is estimated at 18,000 metres, but the accuracy will be degraded due to the lack of spin at launch and susceptibility to cross winds. It does, however, meet a need of the insurgent force for a man-portable, extended range artillery weapon for use against area targets such as airfields.

11. Soviet Anti-Tank Mine TM-57 (SECRET)

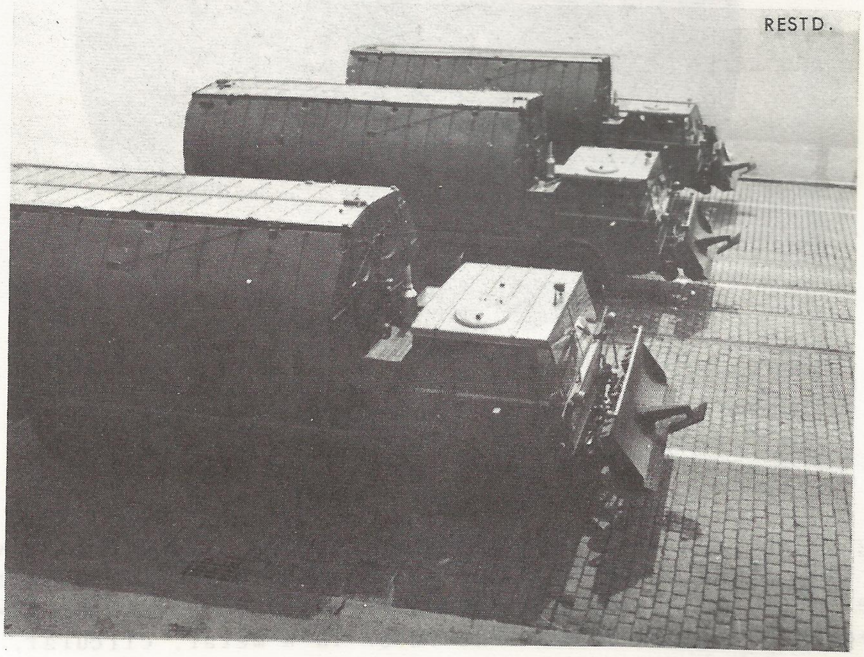

CONFIDENTIAL

Soviet TM-57 Anti Tank Mine

During recent years we have received numerous reports of a variety of Soviet anti-tank mines to replace the well-known TM-46, but no hard intelligence on any of these items could be produced until the TM-57 pictured above was recovered in mid-1970. The TM-57 is a metal, circular, blast-type anti-tank mine, almost identical to the TM-46 in size, weight and colour. The retention of the TM-46 shape and size are to be expected to maintain compatibility with mechanical minelayers, but the metal construction of this mine probably indicates that it has been in existence for some years. (The designation 57 does not necessarily mean that the item has been in the inventory since 1957). It is considered that some plastic anti-tank mines are also in the Soviet arsenal, possibly designated TM-60 and/or TM-62.

12. Recent Development in PMP (CONFIDENTIAL)

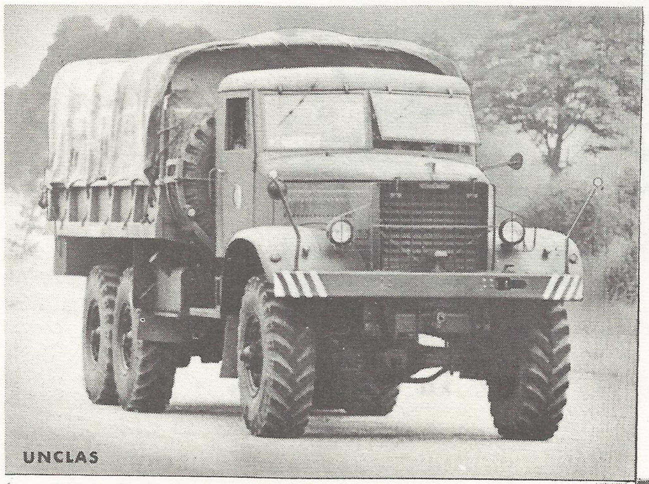
The photograph below shows PMS (The Czechoslovakian version of PMP) being carried on the TATRA 813BZ-D truck during a parade in Prague. The equipment has been seen before on the TATRA 813 but the sighting on the BZ-D (dozer blade attachment) version is new. This vehicle has better off-route mobility than previous PMP carriers and the addition of an inherent dozer blade will considerably enhance the site preparation capabilities of this equipment. Czechoslovakian TATRA vehicles are being adopted by other Soviet bloc countries for various purposes, and it would not be surprising to see this obviously advantageous application adopted elsewhere within the bloc.


RESTD.

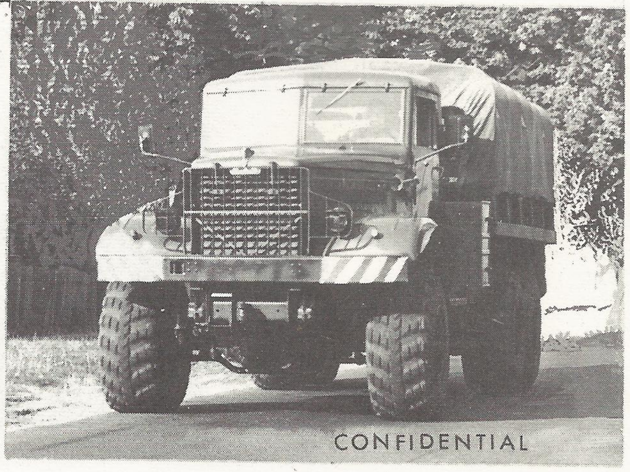
PMS on TATRA 813BZ-D

13. Soviet KrAZ-255B Enters Service (CONFIDENTIAL)

The new SOVIET heavy vehicle, KrAZ-255B, is now often seen in East Germany in the hands of Soviet and East German troops and with the Vopo.



KrAZ-214
GS Truck (6x6)

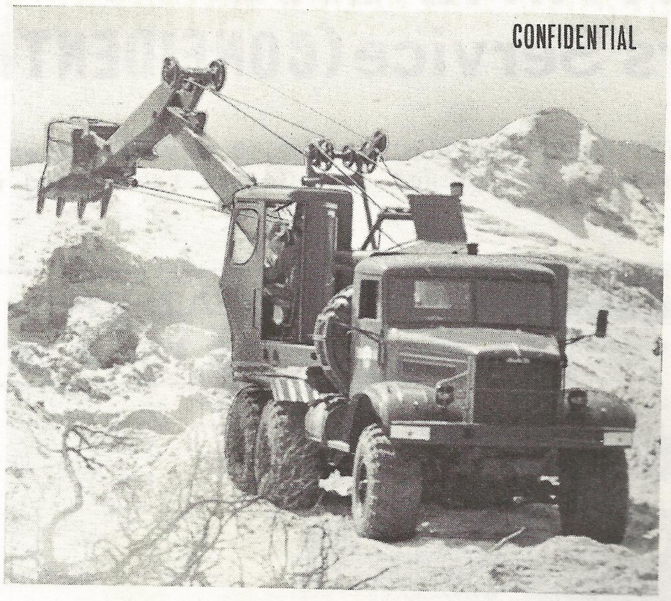


KrAZ-255B
GS Truck (6x6)

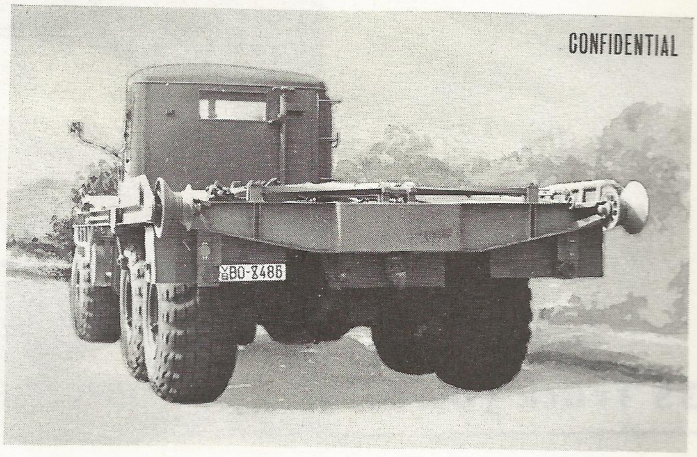
This truck, with a cross country payload of 7500kg (7½ Tonnes), was developed directly from the well-known KrAZ-214. It is a typical example of the Soviet system of "in service" development. Compared with the KrAZ-214 it has a bigger engine with reduced fuel consumption, a strengthened chassis, improved suspension with power steering, wide profile tyres, cab controlled variable tyre pressures and an improved cab. It can be recognised by its wide section tyres, the square "box" behind the cab and by the mud deflectors added to the mudguards.

The net result of these changes is a heavy vehicle with a very good cross country performance. It probably has the best cross country performance of any Soviet B vehicle. It can climb a moist clay 30° slope. It may well be employed as a gun tower for some of the heavier pieces, supplementing/replacing the current tracked artillery tractors.

Soviet KrAZ-255B (cont'd)



KrAZ-255B Face Shovel E305V in operation



KrAZ-255B PMP Bridging Pontoon Transporter

It has already been seen mounting special bodies. Two examples illustrated here - a face shovel and a bridging vehicle.

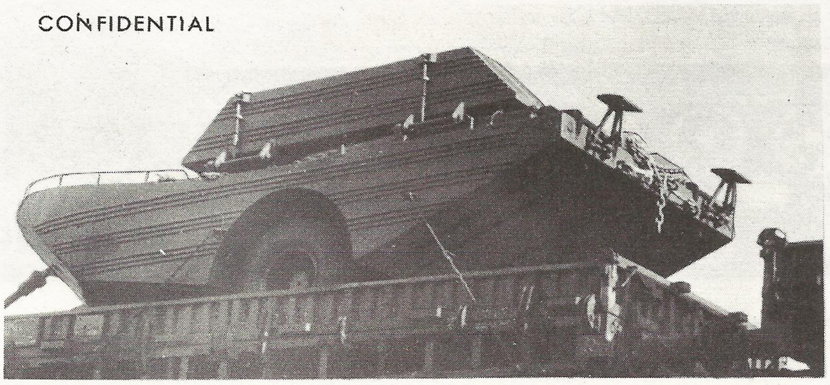
Leading characteristics

Engine:	YaMZ-238 diesel V8 240 hp
Transmission:	manual 5-speed
Kerb weight empty:	11,900 kg
All-up weight:	19,675 kg
Payload:	7,500 kg
Towed load:	
a. Cross country:	10,000 kg
b. Highway:	30,000 kg
Maximum speed:	71 kph
Maximum cruising range	650 km

14. Soviet Amphibious Wheeled Trailer PKP
(PLAVAYUSCHIY KOLESNYY PRITSEP) (SECRET)

An unusual boat-shaped single-axled four-wheeled amphibious trailer has recently been sighted which apparently is designated the PKP. It has been described as being used to increase the capacity of PTS - the Soviet Medium Amphibious Transporter.

CONFIDENTIAL



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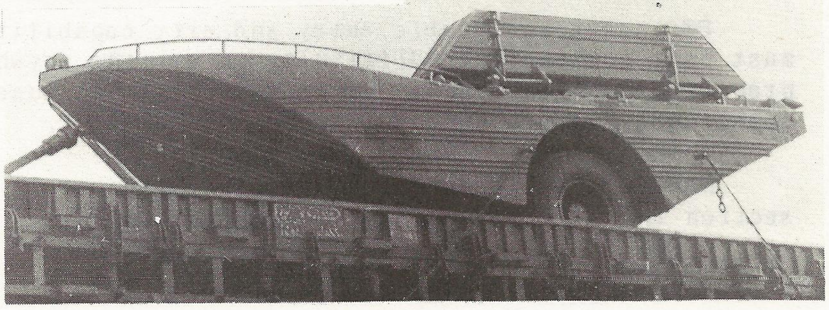


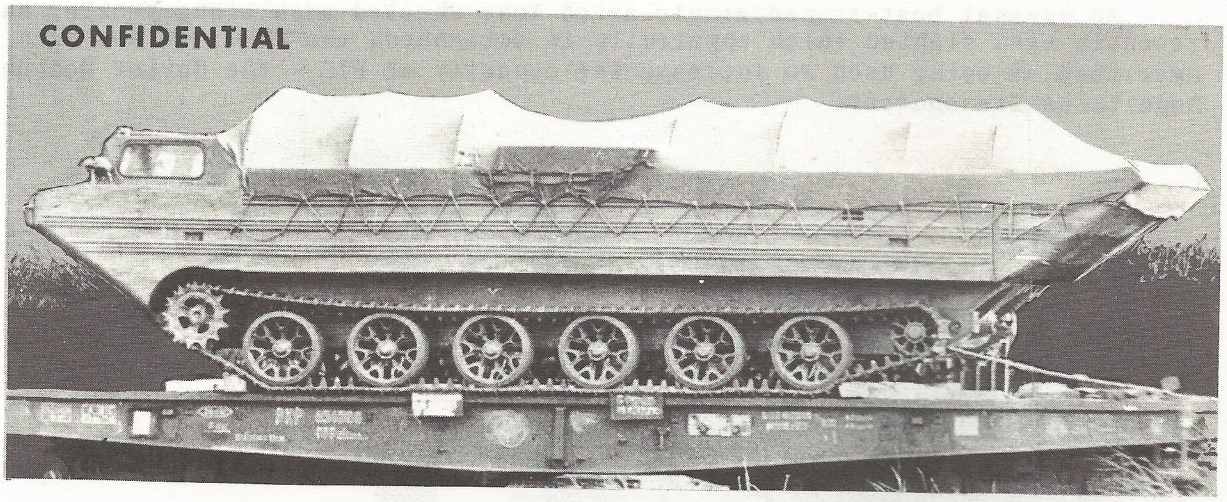
PKP Amphibious Trailer

PKP is about 26 feet (8 m) long, 8½ feet (2.5 m) wide and is decked-in up to the body line. Two large flotation packs, about 15 feet (4.5 m) long and some 2 feet (60 cms) square sit on the deck when the trailer is on the road. When prepared for water use these are swung out and locked onto the trailer sides to give additional flotation.

PKP is designed to carry an artillery piece whilst the artillery tractor is carried in the PTS. Such a combination might be the ATS tractor towing the M-46 130 mm field gun. The gun is probably loaded by tipping the trailer on to the two pads on the rear of the trailer and using the winch on PTS to haul the gun on to the trailer.

It is difficult to visualise how this trailer can operate efficiently in the water with its four wheels and associated wheel arches acting as sea anchors. PTS is designed to be capable of operating across a current flow of 8 feet per second (2.5 m per sec). Add to it some 26 feet (8 m) of PKP and its control problems will become considerable.

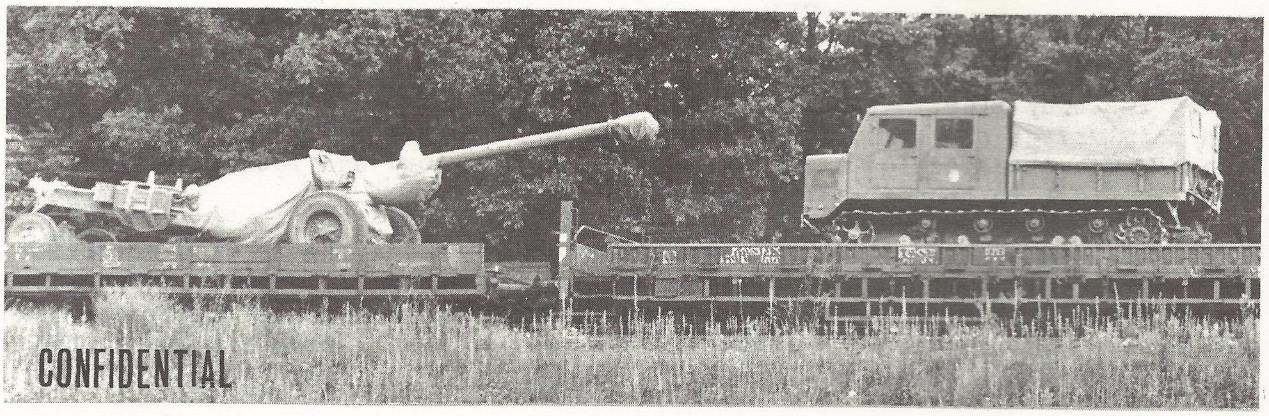
Soviet Amphibious Wheeled Trailer PKP (cont'd)



PTS Amphibious Transporter

PTS has a reasonable entry and exit capability. The PTS/PKP combination must have considerable difficulty in exiting anywhere other than at a carefully prepared and graded site. This must limit its use considerably as it would not appear possible to unload the PKP in the water.

Nevertheless the PTS/PKP together seem to be capable of landing a gun section in one trip - in itself an achievement.



ATS and M-46 130 mm Field Gun

15. Soviet Tactical Missiles– Current Position (SECRET)

Aim

The latest Digests on Soviet Tactical Missiles (Army Technical Intelligence Review Digest No. 87 - Soviet Ground Forces Guided Missiles and Army Technical Intelligence Review Digest No. 85 - Soviet Bloc Artillery) were published in 1967. Since that date a considerable quantity of intelligence has been acquired on several systems, and these Digests no longer represent the complete UK position on Soviet Missiles.

The aim of these notes is to show the major changes in the UK assessment on Soviet Tactical Missiles since 1967.

AT1 SNAPPER

The main change in the UK assessment of the SNAPPER missile, which is used both on the BRDM and the GAZ-69 version, is that its penetration is now believed to be only 300mm or 12 ins. SNAPPER is being replaced by SAGGER.

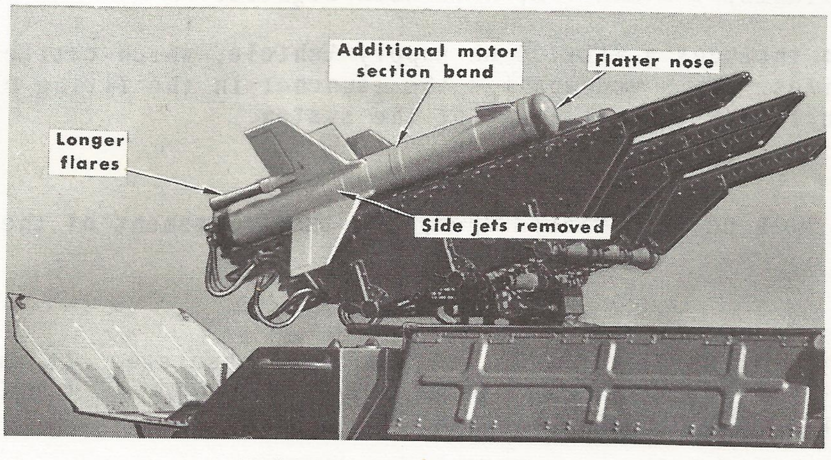
AT2 SWATTER

A modified version of the SWATTER missile has been paraded in Moscow since 1967. It has not been seen in service.

This later version is called SWATTER B (or 2) and, compared with the original missile SWATTER A(or 1), has a blunter nose cone, longer flares, no side jets and a slightly different motor body section.

The range of SWATTER B (or 2) has increased to 3500m.

Both SWATTER missiles are radio controlled and the BRDM system is believed to have a separation capability.



AT2 SWATTER Missile

AT3 SAGGER

The current SAGGER missile is now known to have a maximum range of 3000m and a minimum range of 500m. Earlier models may have had a slightly shorter maximum range and differences in missile length have been noted. (It appears that the missiles paraded on Soviet BRDM are some 75mm (3 in) shorter than those seen elsewhere). The warhead is considerably heavier than first believed, and may be as heavy as 5.9 kg (13 lbs).

SOVIET TACTICAL Missiles. Current Position (cont'd)

The time of flight to maximum range is approximately 25 seconds. Manual command over a wire link is confirmed. The missile is steered by two rear yaw and pitch jetavators, and the four mid-body nozzles are for boost. They probably have some stabilising function during the sustain phase. Although the Man Portable SAGGER Anti-Tank System uses a SAGGER missile (usually the long version) it is a complete system in its own right. The missile breaks down into a warhead section and a motor section, which are both carried in a single plastic container. The lid of this container is used as the base for the launch ramp.

Four missiles are connected to a remote control unit similar to the BRDM remote control unit.

Performance is the same as for the BRDM SAGGER. Man Portable SAGGER is in service with Warsaw Pact infantry and airborne units.

Man Portable SAGGER is also fitted as an integral part of the BMP armament.

FROG 3/4/5 FFR System

FROG 3, FROG 4 and FROG 5 are now known to be the same system with different warheads, which give the system an HE, CW or nuclear capability. FROG 3 has a range of 32 km, and FROG 4 and 5 probably 45 km. The system has a reaction time of 15-30 mins. FROG 3/4/5 is obsolescent.

FROG 7 FFR System

The FROG 7 FFR System is in service in most Soviet divisions ready for early commitment (Category I and II), and to a lesser extent the satellite countries. Its maximum range is approximately 65 km and the minimum range 15 km. This minimum range is achieved by fitting an airbrake device when engaging targets below 30 km. The FROG 7 FFR System has an HE, CW or nuclear capability. Two warhead variants, 7 A and 7 B, have been sighted.

The system includes a ZIL-135 Re-supply Vehicle, which carries three re-supply missiles. This accompanies the launcher in the firing platoon and considerably increases the potential of the system.

SCUD

There has been no significant change in the assessment of the various SCUD systems.

SALISH

The Aerodynamic Missile SALISH is considered obsolete. It was a beam riding missile that was accurately dumped over its target. (CRUISE missiles are now designated AERODYNAMIC missiles).

SHADDOCK

The SHADDOCK Aerodynamic Missile System is in service, but has so far been seen only on parades.

16. Additional Information on the R-123 (CONFIDENTIAL)

An article in a Yugoslav magazine on the maintenance and repair of the Soviet radio R-123 has given us a substantial amount of information on the internal arrangement of the set. We first wrote about this radio in ATIR No. 93 of April 1969, and gave the parameters of the set. This latest article confirms many of these facts, but one important point does emerge which disagrees with a possibility which we suggested in our earlier article. This concerned the use of transistors in the set. We stated that there were strong indications that the receiver might be partially transistorised. We now know that the only transistors used are twelve which are all contained in the power supply unit which is separate from the set.

The set intself appears to be a modern conventional valve equipment using printed board techniques where applicable. It is divided into seven sub-units and uses a total of 32 valves and a number of diodes. The receiver circuit is a double super-hetrodyne type using intermediate frequencies of 7875 and 465 kHz. An interesting point about the transmitter is that we think that a separate RF driver and output valve is used for each band. This is not usual practice, but is possibly used in this set to avoid any switching of coils and capacitors when band changing. This, in turn, will mean that the re-setting accuracy of the four pre-set frequencies will be much higher than they would otherwise be. For the same reason separate RF amplifier valves may be used in the receiver as well. It is an uneconomical technique in terms of circuit components, but may have been the only way of satisfying the user requirement on re-setting accuracy.

We still need to collect a detailed hand-book on this set and we are looking forward to the day when we can acquire an actual set to add to our collection here in London.

17. Soviet Four Wire Rhombic Antenna (CONFIDENTIAL)

A new design of rhombic antenna has appeared in E. Germany during the last year. Rhombic antennas are normally used for long distance HF communications between two points. They are narrow beam wide handwidth devices and provide a great improvement over normal field antennas. However, they are mounted on four masts and the normal pattern requires considerable additional construction as well. The layout of the usual design is shown in Figure I. In particular, the three wires which are fed at one end by a nominal 600 ohm feeder are connected together at the feed point. These then diverge to the two masts on the minor axis and finally converge again to the mast at the far end where they are terminated. This may be either in a 600 ohm resistor at the mast head, or as often fairly high powers are involved, the termination is connected to a down lead leading to an absorber route. The divergence and convergence of the wires is calculated to keep a constant characteristic impedance down the length of the antenna. This prevents unwanted reflections. The whole antenna takes considerable time to erect.

In the new four wire antenna, the wires diverge further from the minor axis masts to the far end where they are terminated on a spreader which is also a short circuit. It appears that there is a transition from a characteristic impedance of 600 ohms at the minor axis to zero at the far end. The rate of divergence has been calculated to keep this change as smooth as possible to prevent unwanted reflections. A sketch of this antenna is shown in Figure 2.

There are several advantages gained with being able to have a short circuited termination. We have thought of the following:

a. Less gear to erect than with an absorber route. Therefore a quicker time in and out of action.

b. Elimination of power waste in the termination; this gives a more efficient antenna.

c. Lends itself to de-icing by passing a fairly small DC or power frequency current round the loop.

d. The short circuit at the far end can be connected directly to earth as a protection against lightning damage.

Once again the Soviets seem to have come up with a simple and effective device.

Soviet Four Wire Rhombic Antenna (cont'd)

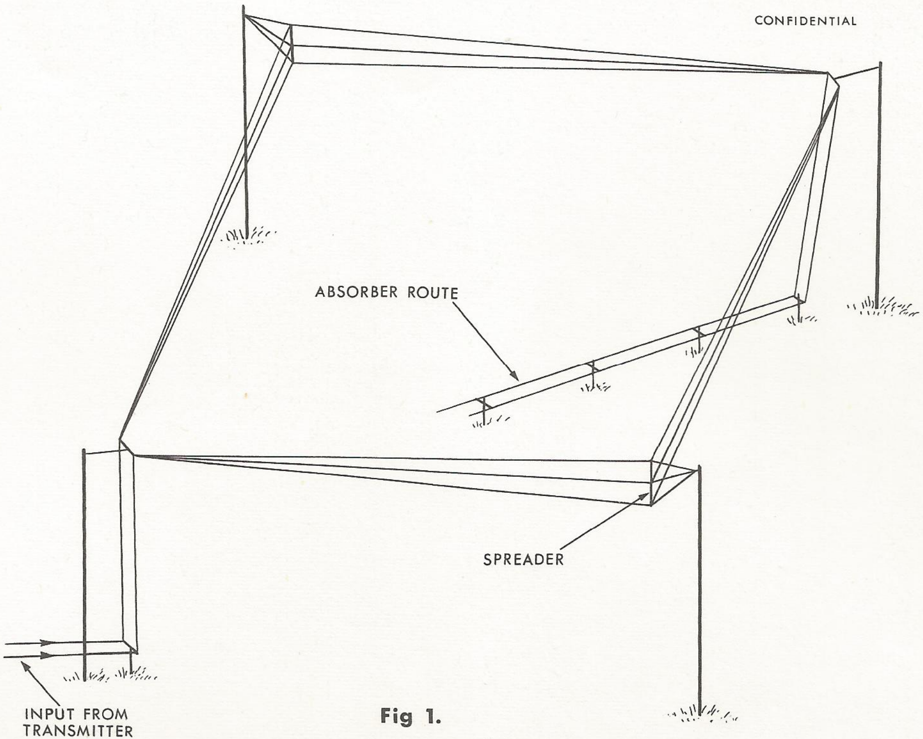

CONFIDENTIAL
ABSORBER ROUTE
SPREADER
INPUT FROM TRANSMITTER

Fig 1.
USUAL DESIGN 'RHOMBIC' ANTENNA

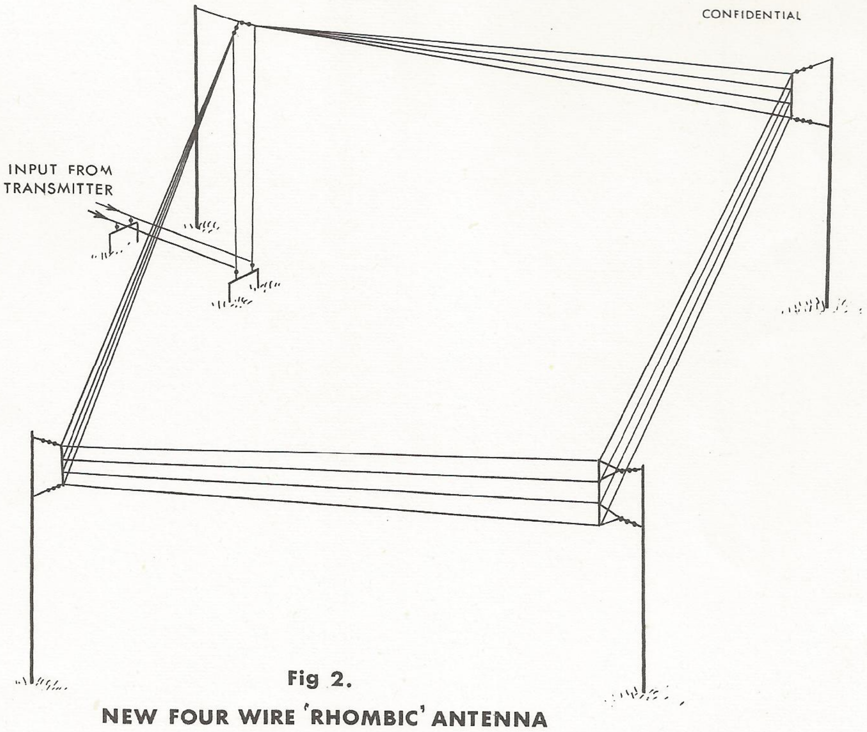
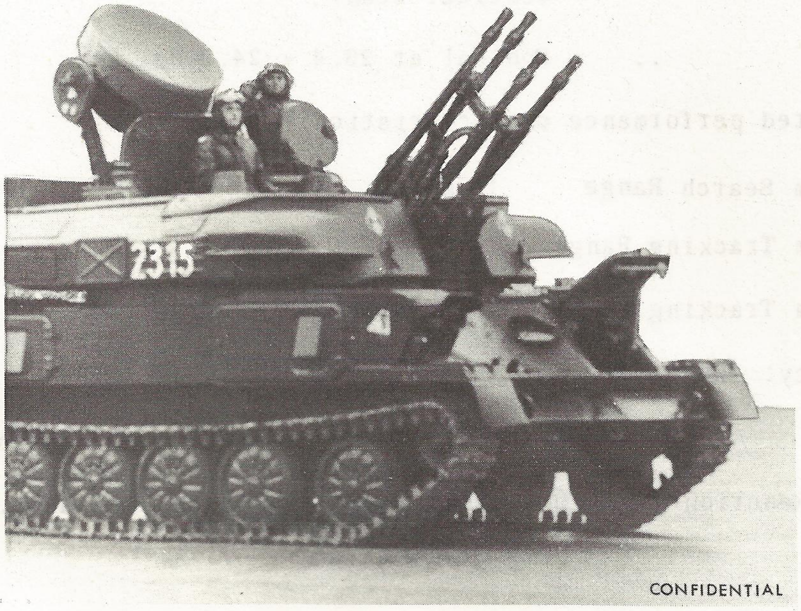

CONFIDENTIAL
INPUT FROM TRANSMITTER

Fig 2.
NEW FOUR WIRE 'RHOMBIC' ANTENNA

18. ZSU-23-4 Fire Control Radar– GUN DISH (SECRET AUSCANUKUS)

The GUN DISH antenna is mounted on the back of the ZSU-23-4 turret. It consists of a circular, probably parabolic reflector, over the face of which is a dielectric cover. It is probably a cassegrain feed with a sub-reflector mounted on the inside face of the dielectric cover.



ZSO-23-4 Fire Control Radar GUN DISH

The radar is capable of providing full firing data to the on-board predictor, and this mode of operation will be used when visibility prevents the use of the optical tracking heads. The normal mode of operation is probably optical tracking with radar range.

A limited search and acquisition mode is incorporated, which covers a limited sector only. Early warning data is required and is probably provided by radio in-put from OPs and the divisional AA battalion EW/Acquisition radars (SPOON REST or FLAT FACE).

The technical characteristics are as follows:

RF	..	14.5 - 15.2 GHz
PRF	..	4450 - 5775 pps
Pulse Width	..	0.1 - 0.6 μ sec
Antenna Gain	..	40.5 db
Beam Width	..	1.4°
Polarisation	..	Probably Linear

ZSU-23-4 Fire Control Radar - GUN DISH (cont'd)

Scan: Search	..	22.3 - 23.2 Hz unidirectional sector: or 13.5 secs bi-directional sector with a 21 Hz unidirectional scan superimposed. (Possibly a combined horizontal and vertical scan)
Track	..	Conical at 23.4 - 24.2 Hz

Estimated performance characteristics:

Maximum Search Range	15 kms
Maximum Tracking Range	8 kms
Minimum Tracking Elevation: (Estimated average)	1°
Accuracy: Range	20m
Azimuth/Elevation	4-5 minutes of arc
Radar Reaction Time (Detection to Steady Track)	4 secs.

19. Soviet Low Altitude SAM Reported in UAR (SECRET AUS CAN UK NZ US)

Reports have been received that a man-pack SAM, called STRELA, has been used by UAR Forces in the Suez Canal area. The missile is believed to be of Soviet origin and employs an uncooled IR homing head. STRELA is some 3-4 inches in diameter, approximately 4 feet long and weighs between 25-30 lbs.

Such a missile would probably have a maximum slant range of approximately 2 nm. The type of homing head employed would limit the effectiveness of this missile and restrict it to engaging receeding targets. It is probably a first generation weapon system.

STRELA has not yet been observed in any Warsaw Pact country. However, such a small weapon could well be developed inside Russia without the knowledge of Western observers.